

What is Claimed:

1. An apparatus for delivering a sealing compound into a puncture extending through tissue, comprising:

a pair of barrels, each barrel having a chamber for storing
5 a component of the sealing compound, each chamber further having access port in a distal portion of the chamber;

a plunger assembly comprising a pair of pistons, each piston
slidable within a respective one of the barrel chambers from a proximal position to a distal position for delivering the
10 components out of the barrel chambers through the respective ports;

an auto-injection assembly coupled to the plunger assembly, the auto-injection assembly comprising a spring mechanism locked in an inactive condition, and an actuator coupled to the spring
15 mechanism, the actuator activatable to release the spring mechanism, whereupon the spring mechanism directs the pistons towards their distal position to thereby deliver the components out of the barrel chambers.

20 2. The apparatus of claim 1, wherein the spring mechanism comprises a spring coupled to the plunger assembly and at least one of the barrels.

3. The apparatus of claim 2, wherein the spring comprises a compression spring compressed between a hub coupled to the barrels and a stop member coupled to the actuator, and a shaft extends from the plunger assembly adjacent the spring, and
5 wherein the stop member comprises a passage that is aligned with the spring when the actuator is activated, whereby the spring is released to contact the shaft and direct the pistons distally into the respective barrel chambers.

10 4. The apparatus of claim 1, wherein the spring mechanism comprises one or more springs disposed within at least one of the barrel chambers.

15 5. The apparatus of claim 4, the plunger assembly further comprising: a handle member comprising a pair of plungers, each plunger disposed proximate a respective one of the pistons and slidable within a respective barrel chamber, the one or more springs comprising springs coupled between the respective plungers and pistons within the respective barrel chambers.

20 6. The apparatus of claim 5, wherein the springs bias the respective pistons towards a predetermined distance from the plungers.

7. The apparatus of claim 1, further comprising a valve coupled to the barrel ports, the valve configured for selectively placing the respective barrel chambers in communication with an
5 outlet line and an inline line.

8. The apparatus of claim 7, further comprising a source of further components of the sealing compound in communication with the inlet line, the valve being movable to a loading
10 position in which the barrel chambers are in communication with the inlet line to receive the further sealing compound components for mixing with the sealing compound components in barrel chambers.

15 9. The apparatus of claim 8, further comprising a "Y" fitting communicating with the respective barrel ports and the valve.

10. The apparatus of claim 1, further comprising a delivery
20 sheath communicating with the barrel ports for delivering a sealing component from the barrel chambers into a puncture through tissue.

11. A method for delivering a sealing compound from a delivery device comprising a pair of barrels including outlets and a plunger assembly slidable within the barrels from a first position to a second position for injecting components out of the barrels through the outlets, the method comprising:

providing sealing components in the barrels with the plunger assembly in the first position;

activating an actuator coupled to a spring mechanism to release the spring mechanism, whereupon the spring mechanism directs the plunger assembly towards the second position to inject the sealing components out of the barrels.

12. The method of claim 11, wherein the sealing components are provided in the barrels by:

moving a valve coupled to the outlets of the barrels to a first position wherein the outlets communicate with containers comprising sealing components therein;

advancing the plunger assembly into the barrels to inject the sealing components in the barrels into the containers to mix the sealing components in the barrels with the sealing components in the containers; and

withdrawing the plunger assembly from the barrels to draw mixed sealing components from the containers into the barrels.

13. The method of claim 12, wherein the sealing components in the barrels comprise one or more buffer solutions, and wherein the sealing components in the containers comprise solid polymer precursor components.

14. The method of claim 13, further comprising shaking the containers to dissolve the polymer precursor components in the one or more buffer solutions.

15. The method of claim 11, further comprising:
introducing a delivery sheath into a puncture through tissue;

connecting the barrels to a lumen of the delivery sheath,
wherein the actuator is activated after the delivery sheath is introduced into the puncture such that the sealing components are injected from the barrels through the lumen of the delivery sheath and into the puncture.

16. The method of claim 15, wherein the barrels are connected to the delivery sheath via a "Y" fitting that mixes the sealing components in the barrels together.

17. The method of claim 15, further comprising:

introducing an occlusion member into the puncture until an expandable member on the occlusion member is disposed within a body lumen communicating with the puncture;

5 expanding the expandable member within the body lumen; and
manipulating the expandable member to substantially seal the body lumen from the puncture before activating the actuator to inject the sealing components into the puncture.

10 18. The method of claim 15, wherein a retraction assembly is coupled to the delivery sheath and the occlusion member, and wherein the plunger assembly triggers a release of the retraction assembly as the plunger assembly slides towards the second position, whereupon the retraction assembly automatically
15 withdraws the delivery sheath at least partially from the puncture to fill at least a portion of the puncture with the sealing components.

19. An apparatus for sealing a puncture through tissue,
20 comprising:

a syringe assembly comprising a plurality of barrels comprising components of a sealing compound therein, a plunger assembly slidable within the barrels from a proximal position to

a distal position for injecting the components out of the barrels;

an auto-injector assembly comprising a spring mechanism locked in an inactive condition, and an actuator coupled to the spring mechanism that is activatable to release the spring mechanism, whereupon the spring mechanism directs the plunger assembly towards the distal position to inject the sealing components out of the barrels;

a delivery sheath comprising a proximal end, a distal end having a size and shape for insertion into a puncture through tissue, and a lumen extending therebetween that communicates with the barrels for delivering the sealing components injected out of the barrels into the puncture.

20. The apparatus of claim 19, further comprising:

a source of sealing components; and

a valve movable between a first position wherein the barrels communicate with the source of sealing components, and a second position wherein the barrels communicate with the lumen of the delivery sheath.

21. An apparatus for delivering a sealing compound into a puncture extending through tissue, comprising:

a pair of barrels comprising components of a sealing compound within interiors of the barrels, the barrels comprising outlets communicating with the respective interiors, the outlets coupled to a valve for selectively opening and closing the

5 outlets;

a plunger assembly slidable within the barrels comprising a pair of pistons slidable within respective barrels, a handle member comprising a pair of plungers disposed proximate the pistons and slidable within the barrels between proximal and
10 distal positions, and springs coupled between the plungers and the pistons within the respective barrels for biasing the pistons towards a predetermined distance from the plungers; and

a latch for securing the handle member relative to the barrels in the distal position, whereby, with the valve closed,
15 the piston.

22. The apparatus of claim 21, further comprising sealing components in the barrels, and wherein the handle member may be advanced distally within the barrels with the valve closed to
20 compress the springs between the plungers and the pistons, whereby, when the valve is opened, the springs direct the pistons distally to inject the sealing components out of the barrels through the outlets.

23. A method for delivering a sealing compound from a delivery device comprising a pair of barrels including outlets and a plunger assembly slidable within the barrels and comprising
5 a pair of pistons slidable within respective barrels, a pair of plungers disposed proximate the pistons and slidable within the barrels between proximal and distal positions, the pistons being biased towards a predetermined distance from the plungers, the method comprising:

- 10 providing sealing components in the barrels with the plungers in a proximal position with the outlets closed;
advancing the plungers into the barrels to a distal position, thereby reducing the distance between the pistons and the plungers to less than the predetermined distance;
15 locking the plungers in the distal position;
opening the outlets; whereupon the pistons automatically advance distally within the barrels to return towards the predetermined distance from the plungers, thereby injecting the sealing components out of the barrels.

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24. The method of claim 23, wherein the sealing components are provided in the barrels by:

opening the outlets with the outlets communicating with a container of sealing components;

advancing the plunger assembly to inject one or more buffers in the barrels into the containers to mix with the sealing

5 components; and

retracting the plunger assembly to draw mixed sealing components into the barrels.